

PATENT APPLN. NO. 10/600,571
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
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IN THE CLAIMS:

1 - 16. (canceled)

17. (currently amended) A process for purifying exhaust gas from a gasoline engine of a fuel-direct-injection type by using an exhaust gas purifying-use catalyst containing a noble metal and a transition metal and which removes hydrocarbons, carbon monoxide and nitrogen oxides from the exhaust gas,

the catalyst being obtained by mixing the noble metal and the transition metal with or carrying the noble metal and the transition metal by a fire-resistant inorganic oxide having a BET surface area of 50 m²/g to 200 m²/g and having a pore diameter of 10 nm to 30 nm, an amount of the noble metal being in a range of 0.01 g/liter to 50 g/liter with respect to catalyst volume, the fire-resistant inorganic oxide being α -alumina, active alumina, titania, zirconia, or a composite oxide of α -alumina, active alumina, titania, and zirconia,

the gasoline engine of a fuel-direct-injection type exhausting exhaust gas, which varies between a first exhaust gas state and a second exhaust gas state, depending on changes in air-fuel ratio,

the exhaust gas entering the first exhaust gas state at an air-fuel ratio of 13 to 15, an exhaust-gas temperature being in a

PATENT APPLN. NO. 10/600,571
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PATENT
NON-FINAL

range of 350°C to 800°C at an inlet of the catalyst in the first exhaust gas state,

the exhaust gas entering the second exhaust gas state at an air-fuel ratio of more than 15 to 50, an exhaust-gas temperature being in a range of 200°C to 500°C at the inlet of the catalyst in the second exhaust gas state.

18. (previously presented) The process for purifying exhaust gas from a gasoline engine as defined in claim 17, wherein:

the exhaust gas varies between the first exhaust gas state and the second exhaust gas state that forms a more oxidizing, low-temperature atmosphere as compared with the first exhaust gas state, depending on changes in air-fuel ratio.

19. (previously presented) The process for purifying exhaust gas from a gasoline engine as defined in claim 17, wherein:

the first exhaust-gas state is a state at a time of high output of the gasoline engine of a fuel-direct-injection type, and the second exhaust-gas state is a state at a time of low output of the gasoline engine.

PATENT APPLN. NO. 10/600,571
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

20. (previously presented) The process for purifying exhaust gas from a gasoline engine as defined in claim 17, wherein:

the exhaust gas is purified by removing hydrocarbon, carbon monoxide and nitrogen oxides from the exhaust gas by the use of the catalyst.

21. (previously presented) The process for purifying exhaust gas from a gasoline engine as defined in claim 17, wherein:

the transition metal is at least one selected from the group consisting of manganese, iron, cobalt, copper and nickel.

22. (previously presented) The process for purifying exhaust gas from a gasoline engine as defined in claim 17, wherein:

the catalyst includes at least one noble metal selected from the group consisting of platinum, rhodium, palladium and iridium.

23. (previously presented) The process for purifying exhaust gas from a gasoline engine as defined in claim 17, wherein:

the exhaust-gas temperature in the second exhaust-gas state ranges from 200°C to 350°C at the inlet of the catalyst.

PATENT APPLN. NO. 10/600,571
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

24. (previously presented) The process for purifying exhaust gas from a gasoline engine as defined in claim 17, wherein:

the catalyst includes platinum and rhodium as the noble metal.

25. (previously presented) The process for purifying exhaust gas from a gasoline engine as defined in claim 17, wherein:

the catalyst includes at least one of a cerium-oxide powder and a zirconium-oxide powder.

26. (new) The process for purifying exhaust gas from a gasoline engine as defined in claim 17, wherein:

when the temperature of the exhaust gas at the inlet of the catalyst is not more than 300°C, the catalyst is able to purify the exhaust gas that is in the second exhaust gas state.

27. (new) The process for purifying exhaust gas from a gasoline engine as defined in claim 17, wherein:

when the temperature of the exhaust gas at the inlet of the catalyst is not less than 500°C, the catalyst is able to purify the exhaust gas that is in the first exhaust gas state.

PATENT APPLN. NO. 10/600,571
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

28. (new) The process for purifying exhaust gas from a gasoline engine as defined in claim 26, wherein:

when the temperature of the exhaust gas at the inlet of the catalyst is not less than 500°C, the catalyst is able to purify the exhaust gas that is in the first exhaust gas state.

29. (new) The process for purifying exhaust gas from a gasoline engine as defined in claim 17, wherein:

when the temperature of the exhaust gas at the inlet of the catalyst is higher than 500°C, the catalyst is unable to reduce NO_x contained in the exhaust gas that is in the second exhaust gas state.

30. (new) The process for purifying exhaust gas from a gasoline engine as defined in claim 26, wherein:

when the temperature of the exhaust gas at the inlet of the catalyst is higher than 500°C, the catalyst is unable to reduce NO_x contained in the exhaust gas that is in the second exhaust gas state.

31. (new) The process for purifying exhaust gas from a gasoline engine as defined in claim 27, wherein:

PATENT APPLN. NO. 10/600,571
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

when the temperature of the exhaust gas at the inlet of the catalyst is higher than 500°C, the catalyst is unable to reduce NO_x contained in the exhaust gas that is in the second exhaust gas state.

32. (new) The process for purifying exhaust gas from a gasoline engine as defined in claim 28, wherein:

when the temperature of the exhaust gas at the inlet of the catalyst is higher than 500°C, the catalyst is unable to reduce NO_x contained in the exhaust gas that is in the second exhaust gas state.